Course Overview

CSC 209 Data Structures

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What is this course about?

- **Data Structures**
  - How to organize data in your application so it can be *efficiently accessed and manipulated*?
  - How to implement commonly used data structures in Java?
  - How to use the Java Collection Frameworks (JCF)?

- **Analysis of Algorithms**
  - How to analyze code and predict how fast it will run and how much memory it will require?

Topics and Schedule

Week #	Topic
1	Course overview, Review of Java: Class, Abstract Data Types (ADT), Java Collection Framework (JCF)
2	Review of Java: Interface, Generic Types
3	Analysis of Algorithms (Big-O notation, selection sort, insertion sort), NP-completeness and Undecidability
4	Linked Lists: Singly, Doubly, Circular
5	ArrayList, LinkedList, Vector
6	Stacks and Queues
7	Recursion: Numerical Applications
	Midterm exam
8	Recursion: Tail Recursion, Backtracking
9	Binary Tree, Tree Traversal
10	Sorting (divide-and-conquer): Mergesort, Quicksort
11	Sorting: Binary heap and heapsort
12	Map ADT, Hashing, HashMap, TreeMap
13	Binary Search Tree
14	Graph data structures, Graph traversal
15	Crawling Wikipedia
16	Information retrieval and Boolean search
	Final exam

Grading

- Midterm Exam 30%
- Final Exam 40%
- Programming assignments 30%

Course Materials

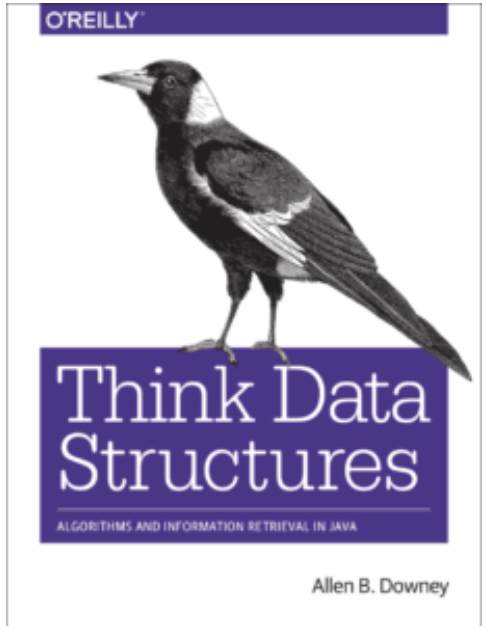
- Lecture Slides:

  https://learning.sit.kmutt.ac.th/#/subjects/221

- Example programs:

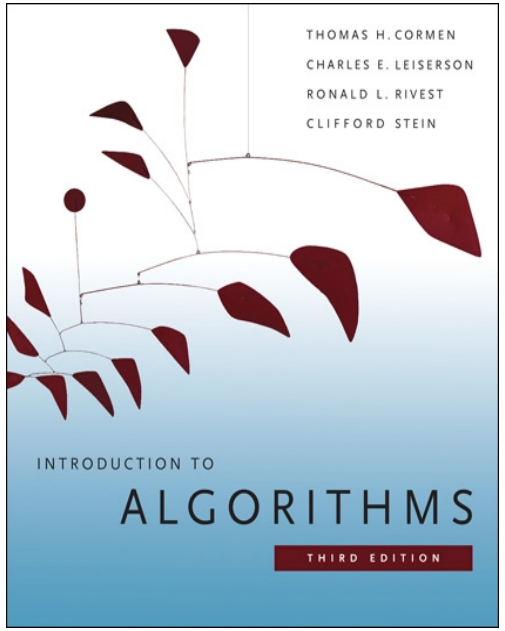
  https://github.com/kulwadeesom/csc209_256002

Recommended Textbooks

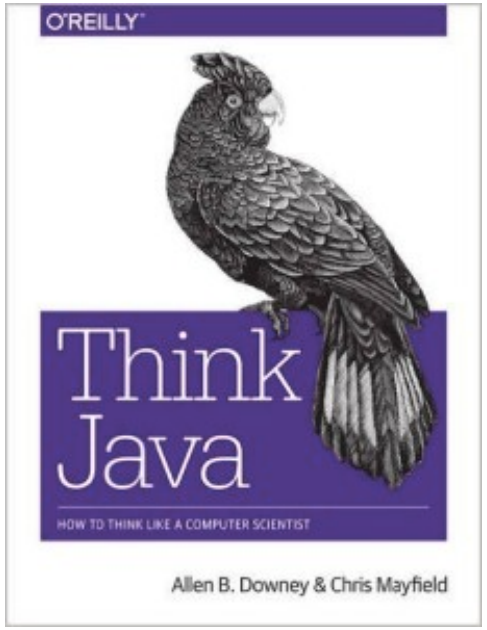


http://greenteapress.com/wp/think-data-structures/

https://algs4.cs.princeton.edu/home/



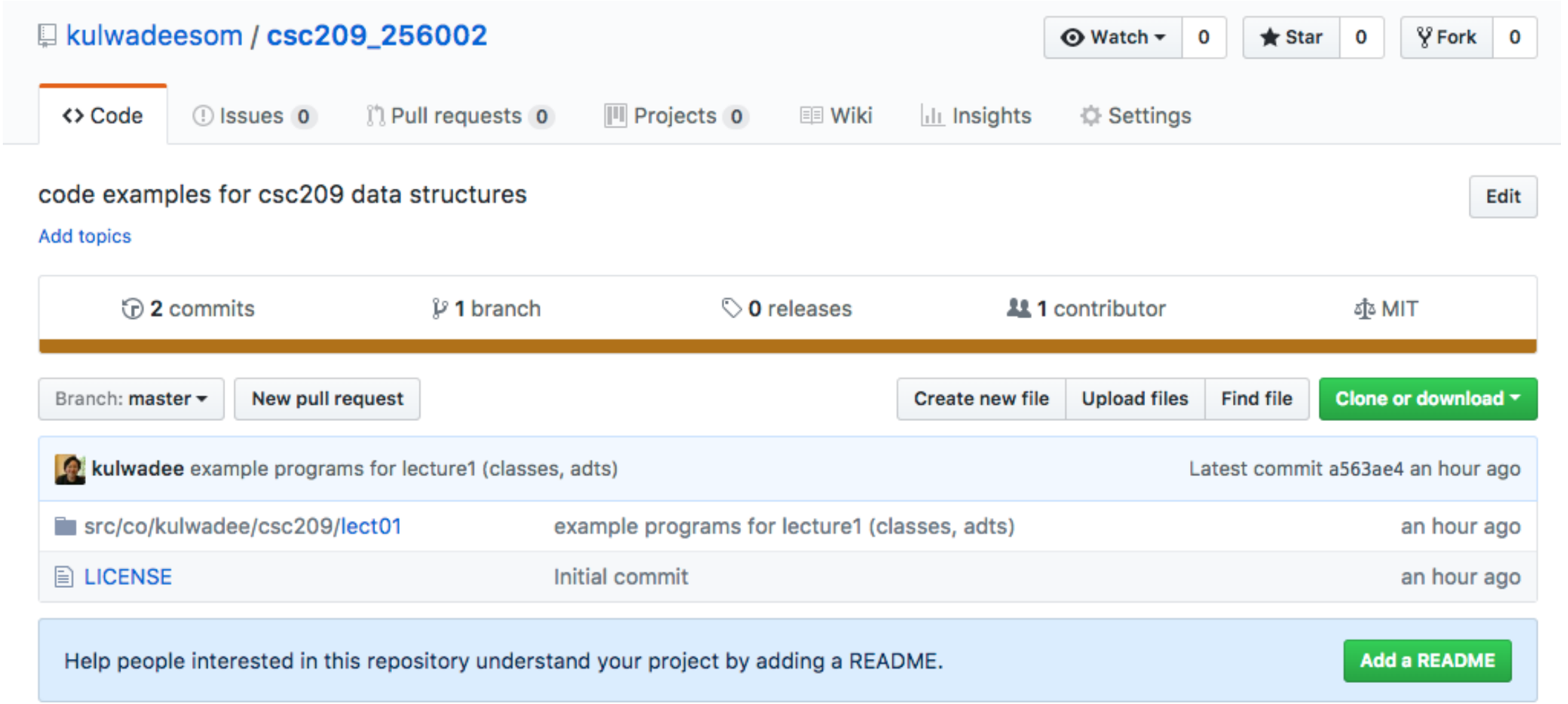
https://mitpress.mit.edu/books/introduction-algorithms



http://greenteapress.com/wp/think-java/

Obtaining example programs from GitHub

https://github.com/kulwadeesom/csc209_256002



Obtaining example programs from GitHub

1. Open the ‘Git’ perspective in Eclipse.

   Window → Perspective → Open Perspective → Other… → select Git

2. Copy the Git repo URI to Clipboard: https://github.com/kulwadeesom/csc209_256002.git

3. Inside Eclipse, right-click on the ‘Git Repositories’ pane.

4. Click Next two times, and select a destination directory (DESTDIR) on your local machine.

5. Click Finish.

6. Switch to ’Java’ perspective.

7. Create New Java Project from the source code in the DESTDIR.